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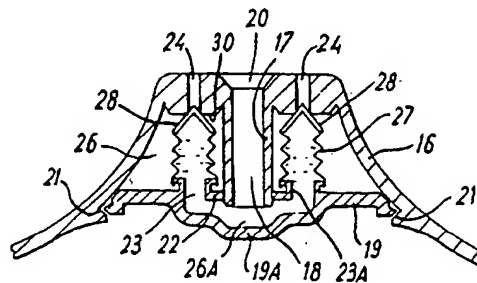
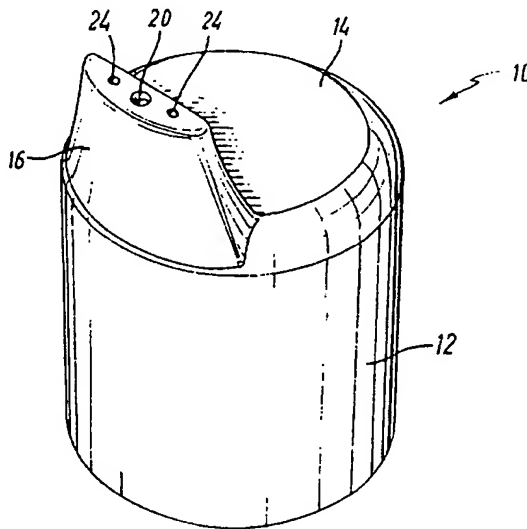
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: CONTAINER CLOSURE

## (57) Abstract

A child's drinking cup (10) has a releasable lid (14) providing a mouthpiece (16). Sucking on the latter causes air to be drawn from the valve members (27) through a channel (18), whereby to open the valves and allow liquid from the container (12) to be sucked into a space (26) and therefrom through the open mouths (24) out of the mouthpiece (16). On release of the sucking action, the valve members (27) automatically close, thereby providing a reliable seal to the cup when not in use.



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Container Closure

The present invention concerns an arrangement for closing a container for liquids, and in particular relates to an arrangement suitable for use with a child's drinking cup.

Drinking cups are often provided for young children in which the cup is covered and sealed by a lid including a spout or mouthpiece through which a liquid from a container may be drunk. The spout facilitates the use of the cup by very young children, and also the lid helps to prevent accidental splashing or spillage of the drink. However, as the spout remains open such a cup cannot be considered as leakproof, and this is a considerable drawback in situation where the cup is likely to be knocked over accidentally or, for example, when travelling when there would ideally be provided a completely closeable and leakproof container within which a beverage may be transported, subsequently serving as a cup from which a child may drink the contents.

The present invention seeks to mitigate and/or obviate these or other problems.

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According to the invention there is provided a closure assembly for a container for liquids, the assembly comprising a closure member adapted to be releasably mounted on the container, and a through passage in the closure member for passage of liquid from the container to an outlet, and normally-closed valve means associated with the through passage, the valve means being openable by the application of negative pressure to the closure member.

Preferably the closure member has means defining a channel which opens at one end externally of the closure member and at the other end is in communication with the valve means, whereby the application of the negative pressure may take place through the channel. The valve means may include at least one valve member of a bellows configuration, the internal space of which is in communication with the channel, and a valve face is normally seated across the outlet to prevent flow of liquid through the outlet until there is a reduction of pressure within the valve member. A pair of valve members may be provided, each associated with a respective outlet, and the valve members may be formed of silicone. A valve assembly including the valve means may be releasably fitted in the closure member and may have a similar overall size to that of the closure member for safety purposes.

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The closure member may take the form of a mouthpiece on a closure lid for a drinking vessel, whereby negative pressure can be applied by sucking the mouthpiece.

According to the invention there is further provided a drinking vessel having a closure assembly as defined in any of the three preceding paragraphs.

The invention will be further described for the purposes of illustration only with reference to the accompanying drawings in which:-

Fig. 1 is a perspective view of a drinking cup incorporating the invention; and

Fig. 2 is a cross-section on an enlarged scale of a valve arrangement of the cup of Fig. 1.

Referring to Fig. 1, a child's drinking cup 10 comprises an open-topped container part 12 and a lid 14, each of which may conveniently be moulded from a rigid plastics material. The lid 14 may be screwed or snap-fitted on the container 12 to provide a liquid-tight seal. A spout 16 is provided to project from the periphery of an upper surface of the lid 14. The spout 16 is upwardly tapered and of convenient dimensions to permit it to act as a mouthpiece through which a child may take a beverage contained within the

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cup 10. In the present example, the spout 16 is integrally moulded with the lid 14.

As is best shown in Fig. 2, the spout 16 is provided with a tubular extension 17 defining a central internal channel 18 having a mouth 20 opening at the free end of the spout 16.

Two further openings 24 are provided in the spout 16, one each side of the mouth 20.

A valve assembly is mounted within the spout 16 and comprises a closure plate 19 which, at its respective side edges, interfits with internal shoulders 21 of the spout 16 to define a space 26 communicating with openings 20 and 24. The closure plate 19 has a central recessed part 19A, overlying which is a flange 22, thereby defining a cavity 26A, the flange having a central aperture by which to locate over the free end of the tubular extension 17. A pair of through apertures 23 are provided in the flange at respective sides of the central aperture and therefore, in use, on respective sides of the tubular extension 17, each aperture 23 having on the side thereof remote from the central cavity 26A, an upstanding boss defining a peripheral lip 23A. When fitted to the spout 16, the closure plate 19 defines the space 26 above the flange 22 bounded at the

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sides by the wall of the spout and the wall of the tubular extension, the space 26 communicating both with the respective mouth 24 and with the central cavity 26A, the latter communication being through the respective aperture in the flange 22.

The valve assembly further includes a pair of valve members 27 each having the form generally of a flexible bellows, preferably formed of silicone. Each valve member 27 is open at one end to locate over the respective peripheral lip 23A on the flange 22 of the closure plate 19, and at its other end is closed by a valve face 28 which can locate on a valve seat 30 of the respective mouth 24 to close communication between the latter and the internal space 26. Each valve member 27 is biased to an extended position in which the valve face 28 sealingly seats on the mouth 24. The internal space of each valve member 27 is therefore in communication with the internal channel 18 but is closed relative to the internal space 26 of the spout 16, which is in communication through suitable apertures (not shown) with the interior of the container 12.

In normal circumstances, liquid flows from the body of the cup 10 into the space 26, but is prevented from exiting through either mouth 24 by the respective valve face 28. When it is required to drink liquid from

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the container 12, the spout 16 is placed into the child's mouth and sucked, thereby causing air to be drawn from the channel 18 and the cavity 26A. This causes the bellows of each valve member to collapse so that each valve face 28 is pulled in the downward direction as shown in Fig. 2 and away from the respective valve seat 30, thereby allowing liquid to be sucked into the space 26 from the interior of the container 12, and therefrom into the mouth 24 and out of the spout 16. On release of the sucking action, recovery of the bellows returns each valve member 27 to the closed position.

There is thus shown an arrangement which is simple to manufacture and use and which provides a reliable seal to the drinking vessel except when it is positively opened by the action of a child drinking.

The valve assembly may be removably mounted in the spout for cleaning purposes, although the removable mounting would require to be tamper-proof. The valve assembly may be locatable in the spout as described and shown or may alternatively take the whole size of the lid, as the increased size would make it impossible for the valve assembly, if for any reason it did become detached from the lid, to be placed into a child's mouth.

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Modifications may be made within the scope of the invention. In an alternative embodiment (not shown) a separate valve arrangement may be provided for insertion into an appropriate spout 16. The arrangement and configuration of the valve may be different from that described and shown. The cup 10 may be made of any convenient material or materials bearing in mind particular requirements, for example as regards the ability to sterilise the cup, or place it within a dishwasher or microwave oven. The container 10, although described with reference to a child's cup, may also find use for invalids and the elderly.

Claims:-

1. A closure assembly for a container for liquids, the assembly comprising a closure member (14) adapted to be releasably mounted on the container (10), and a through passage (18) in the closure member (14) for passage of liquid from the container (10) to an outlet (24) characterised in that normally closed valve means (27, 28) is associated with the through passage (18), the valve means (27, 28) being openable by the application of negative pressure to the closure member.
2. An assembly according to Claim 1, characterised in that the closure member (14) has means defining a channel (18) which opens at one end (20) externally of the closure member and at the other end is in communication with the valve means (27, 28), whereby the application of the negative pressure may take place through the channel (18).
3. An assembly according to Claim 2, characterised in that the valve means includes at least one valve member (27) of a bellows configuration, the internal space of which is in communication with the channel (18), and a valve face (28) is normally seated across the outlet (24) to prevent flow of liquid through the outlet (24)

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until there is a reduction of pressure within the valve member (27).

4. An assembly according to Claim 3, characterised in that a pair of valve members (27), is provided, each associated with a respective outlet (24).

5. An assembly according to Claim 3 or 4, characterised in that the or each valve member (27) is formed of silicone.

6. An assembly according to any of the preceding Claims, characterised in that a valve assembly including the valve means (27, 28) is releasably fitted in the closure member.

7. An assembly according to any of the preceding Claims, characterised in that a valve assembly including the valve means (27, 28) has a similar overall size to that of the closure member (14).

8. An assembly according to any of the preceding Claims, characterised in that the closure member has the form of a mouthpiece on a closure lid for a drinking vessel, whereby negative pressure can be applied by sucking the mouthpiece.

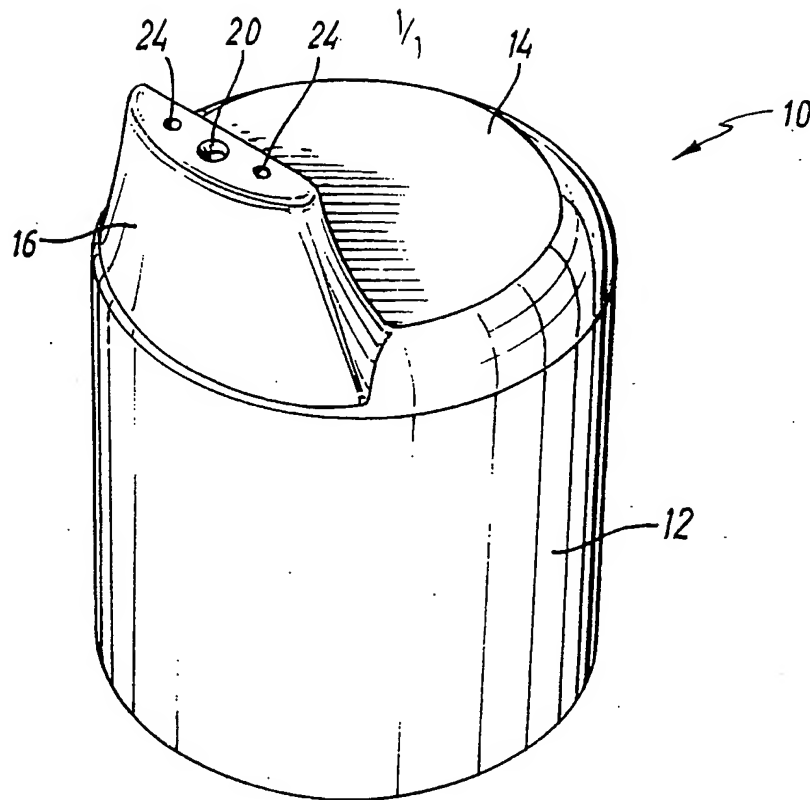
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9. A drinking vessel characterised by a closure assembly according to any of the preceding Claims..

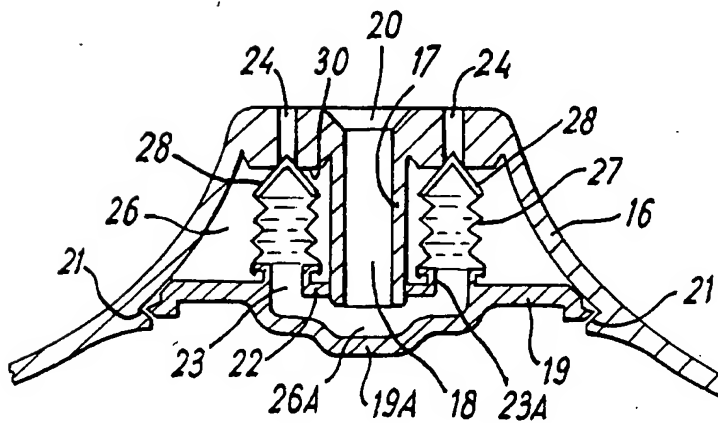
10. A closure assembly for a container for liquids substantially as hereinbefore described with reference to the accompanying drawings.

11. A drinking vessel substantially as hereinbefore described with reference to the accompanying drawings.

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**File 1**



FTE.2

## INTERNATIONAL SEARCH REPORT

 Internat . Application No.  
 PCT/GB 94/02291

 A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 6 A47G19/22 B65D47/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A47G B65D A61J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,C,291 504 (BERGEMAN) 22 April 1916 see the whole document ---	1,2,5-11
X	US,A,5 079 013 (BELANGER) 7 January 1992  see column 6, line 19 - column 11, line 13; figures ---	1,2,5,6, 8-11
X	FR,A,2 325 570 (A/S ALTO) 22 April 1977 see page 2, line 16 - page 4, line 15; figure ---	1,5-11
A	---	2
X	EP,A,0 266 067 (KOSA DESIGN LIMITED) 4 May 1988 see page 8, line 8 - page 8, line 58; figures 14,15A,15B --- -/--	1,2,5, 8-11

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☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB,A,2 187 722 (JACKEL INTERNATIONAL PTY LTD) 16 September 1987 see claims 1,3; figures ---	5
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